



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/004,401	11/15/2001	Bahram Javidi	UCT-0020-01	5923

7590 11/03/2004  
Paul A. Levitsky  
Competitive Technologies, Inc.  
1960 Bronson Road  
Fairfield, CT 06430

EXAMINER

MARIAM, DANIEL G

ART UNIT	PAPER NUMBER
----------	--------------

2621

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/004,401

**Applicant(s)**

JAVIDI ET AL.

**Examiner**

DANIEL G MARIAM

**Art Unit**

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Abstract*

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

### *Claim Objections*

2. Claim 1 is objected to because of the following informalities: in claim 1 the limitation "converted to a signal representative of said input recited in (step a), and converting said input to a signal representative of said input, recited in (step b) appears to be repetitive. Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites the limitation "broader field" in line 3. Does this mean the broader field includes non-object areas? Please clarify.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 4, 6, 9, 12, 14, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Huang, et al. (Road Sign Interpretation Using Matching Pursuit Method).

With regard to claim 1, a method of processing an image wherein said image is viewed from a host, i.e., vehicle (See for example, section 4, 2<sup>nd</sup> paragraph, page 332), comprising the steps of: (a) initiating a scan of an object within a broader field so as to obtain an input, wherein said input is *capable of* being converted to a signal, i.e., coefficient vector and/or  $S^k$ , representative of said input, (b) converting said input to a signal representative of said input (See section 2, page 329; section 3.2.1, page 330; and section 3.3, pp. 331-332); (c) comparing said input with each one of a set of stored inputs, i.e., proto-sign coefficient vectors, to determine a match (See section 3.3 and 4, pp. 331-332) ; (i) if a match is determined, then causing an action, i.e., identifying the road sign, to be performed in accordance with a set of instructions, i.e., validate/identify, discard, associated with said stored input (See section 2, page 329; and sections 3.3-4, pp. 331-332); and (ii) if a match is not determined then continuing to scan said broader field for a second or subsequent image (which correspond to the computation of every classes of

Art Unit: 2621

response image, i.e.,  $S^k$ , to be subjected to said comparison step (See for example section 3.3pp. 331-332).

Claim 9 is rejected the same as claim 1. Thus, argument analogous to that presented above for claim 1 is applicable to claim 9. Claim 9 distinguishes from claim 1 only in that it recites the limitation "a method for automatically identifying a road sign from a moving vehicle" which is clearly taught by Huang, et al. as shown in section 4, page 332.

With regard to claim 4, the method of claim 9, wherein said object is a particular road sign, i.e., triangular road sign (See section 4, last paragraph, page 332).

With regard to claim 6, wherein said stored input is indicative of one or more road signs (See section 4, last paragraph, page 332).

Claim 12 is rejected the same as claim 4. Thus, argument analogous to that presented above for claim 4 is applicable to claim 12.

Claim 14 is rejected the same as claim 6. Thus, argument analogous to that presented above for claim 6 is applicable to claim 14.

With regard to claim 18, the system of claim 17, wherein said host is a vehicle and wherein said system is mounted on said vehicle so as to be in a position to scan for road signs (See section 4, 1<sup>st</sup> and 2<sup>nd</sup> paragraph).

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1, 9, 12, 14, and 17-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Laumeyer, et al. (6,453,056).

With regard to claim 9, (9) a method for automatically identifying a road sign from a moving vehicle (See for example, col. 4, lines 9-35; and Fig. 3A), said method comprising the steps of: (a) initiating a scan of a road sign so as to obtain an identifying input wherein said identifying input is *capable of* being converted to a signal representative of said road sign (See for example, col. 18, lines 36-38); (b) comparing said identifying input with each one of a set of stored road sign inputs, i.e., second pixel set, to determine a match (See for example, col. 18, lines 39-42); and (i) if a match is determined, then causing an action, i.e., storing the matching set in an identified field of a database structure, to be performed in accordance with a set of instructions, i.e., discarding the pixel set if no match is detected, and storing them if a match is detected, associated with said stored input (See for example, col. 18, lines 43-43-45); and (ii) if a match is not determined then continuing to scan for a second or subsequent road sign to be subjected to said comparison step. This feature is inherent within the iterative comparing process, which is described, in col. 18, lines 39-42. What this means is that, if the two pixel set do not match, a repetitive comparison is performed for the remaining pixels until the entire set is analyzed to find a match. Thus, requirements (a and b) of claim 9 are met.

With regard to claim 1, claim 9 encompasses all of the limitation of this claim. Thus, argument analogous to that presented above for claim 9 is equally applicable to claim 1. As to the recitation in the preamble the image is viewed from a host, i.e., vehicle (See for example, Fig. 3A)

Art Unit: 2621

With regard to claim 12, the method of claim 9, wherein said object is a particular road sign, i.e., informational signs, warning signs, etc (See for examples, col. 4, lines 9-13).

With regard to claim 14, the method of claim 9, wherein said stored input is indicative of one or more road signs (See for example, Fig. 7).

With regard to claim 17, a) means, i.e., camera, for scanning an image (See for example, item 10, in Fig. 3A); (b) conversion means for converting said scanned image to a set of data (See for example, col. 18, lines 36-38) for comparison with one or more stored sets of data wherein said one or more stored sets of data are representative of one or more expected images (See for example, col. 18, lines 39-42); (c) a set of instructions, i.e., discarding if no match is detected, and storing if a match is detected, associated with each one of stored sets of data wherein said set of instructions is indicative of an action, i.e., storing the matching set in an identified field of a database structure, to be performed by said host, i.e., vehicle, if a match is determined between said set of data and a one of said stored sets of data, i.e., a second bitmap pixel set, (d) comparison means for comparing said set of data to each one of said stored sets of one or more images, (e) determination means for determining whether or not said set of data matches one of said stored sets of data (See for example, col. 18, lines 43-45); and (f) transmission means for transmitting a signal from said system, i.e., items 10, 20, 30, and 40, in Fig. 3A, to said host to react in accordance with said set of instructions. The sequence of images captured by the system shown in Fig. 3A are compared to detect a match, and if a match is found the matched data is conveyed to the image acquisition vehicle so as to store the matched data (See for example, Figs. 3A and 5).

Art Unit: 2621

With regard to claim 18, the system of claim 17, wherein said host is a vehicle and wherein said system is mounted on said vehicle so as to be in a position to scan for road Signs (See for example, Fig. 3A where the camera/imaging system are mounted on the vehicle).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang, et al. (Road Sign Interpretation Using Matching Pursuit Method) in view of Franke (Autonomous Driving Goes Downtown).

With regard to claim 17, Huang, et al (hereinafter "Huang") discloses all of the claimed subject matter as already discussed above for claim 1, and the arguments are not repeated herein, but are incorporated by reference. Additionally, applicant's attention is invited to section 4, lines 6-7 as to a system mounted on a host, wherein the system corresponds to the camera, and the host corresponds to a vehicle. Claim 17 distinguishes from claim 1 only in that it recites the limitation transmitting a signal from the system to the host to react in accordance with said set of instruction. However, Franke (See for example, "under the heading Urban application and vision", page 40) teaches this feature.



Huang and Franke are combinable because they are from the same field of endeavor, i.e., road/traffic sign detection and recognition (See for example, page 42, under the heading “object recognition”). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Franke with Huang. The motivation for doing so is to transfer the identified or recognized data or sign to the host, i.e., vehicle, and to do so would at least enable the vehicle to react based on the transferred data. For example, if the transferred sign is a stop sign, it will inform the host to stop for a stop sign. Therefore, it would have been obvious to combine Franke with Huang to obtain the invention as specified in claim 17.

With regard to claim 20, (a) a first memory for storing said stored sets of data and (b) a second memory for storing said set of instructions, i.e., correct, false (which reads on Tables 1-2, detection phase and recognition phase, page 333). While Huang does not show the storing of the sets of data and the instructions separately, It would have been an obvious matter of design choice to modify the storage as taught in section 4, last paragraph, page 332 of Huang by using two specific storages, one for the sets of data and the other for the set of instructions, since no new or unexpected results are seen to be attained by having a first and second memory for storing sets of data and set of instructions respectively.

11. Claims 2, 3, and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang, et al. (Road Sign Interpretation Using Matching Pursuit Method) in view of Perez, et al. (Scale and Illumination-Invariant Road Sign Detection).

With regard to claim 3, Huang discloses all of the claimed subject matter as already discussed above for claim 1, and incorporated herein by reference. Huang further teaches filtering the stored input using nonlinear filtering, i.e., MP filter (See section 3.2-3.2.1, page

Art Unit: 2621

330). Huang does not expressly call for converting a predetermined input via a Fourier transform of said predetermined input to produce a stored input. However, Perez, et al. (1<sup>st</sup> paragraph, page 748) teaches this feature. Huang and Perez, et al are combinable because they are from the same field of endeavor, i.e., road sign detection and recognition (See 1<sup>st</sup> paragraph, page 748). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Perez, et al with Huang. The motivation for doing so would at least enhance the accuracy of detecting and recognizing road signs. Therefore, it would have been obvious to combine Perez, et al with Huang to obtain the invention as specified in claim 3.

With regard to claim 2, claim 1 substantially encompasses the limitations of this claim, and is rejected the same as claim 2. Thus, argument similar to that presented above for claim 3 is equally applicable to claim 2.

Claims 11 and 10 are rejected the same as claims 3 and 2 respectively. Thus, argument similar to those presented above for claims 3 and 2 are equally applicable to claims 11 and 10.

12. Claims 5, 7,-8, 13, 15-16, and 19 are rejected under 103(a) as being unpatentable over Laumeyer, et al. (6,453,056) in view of Sekine, et al. (5,963,148).

With regard to claim 13, Laumeyer, et al (hereinafter "Laumeyer") discloses all of the claimed subject matter as already discussed above in paragraph 8, and incorporated herein by reference. While Laumeyer discloses several types of object recognition other than road signs (See col. 4, lines 14-28), Laumeyer does not explicitly call for the object being a particular animal. However, Sekine, et al. (col. 4, lines 31-44) teaches this feature. Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the teaching as taught by

Art Unit: 2621

Sekine, et al into the system of Laumeyer if for no other reason than to identify objects, such as animals or humans, existing on the road, and to do so would at least allow the operator of the vehicle to take appropriate countermeasure such as reducing speed to avoid undesirable events.

With regard to claim 15, the method of claim 9, wherein said stored input is indicative of one or more animals (See col. 4, lines 31-44 of Sekine, et al).

With regard to claim 16, the method of claim 9, wherein at least one of said set of instructions comprises a stop instruction for stopping movement of said host. Given the broadest reasonable interpretation, this feature reads on speed reduction for the avoidance of obstruction or hazardous situation will eventually leads to the stoppage of the vehicle/host (See col. 4, lines 49-61 of Sekine, et al).

Claim 19 is rejected the same as claim 16 except claim 19 is an apparatus claim. Thus, argument similar to that presented above for claim 16 is equally applicable to claim 19.

Claims 5, 7, and 8 are rejected the same as claims 13, 15, and 16 respectively. Thus, arguments analogous to those presented above for claims 5, 7, and 8 are respectively applicable to claims 13, 15, and 16.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent Numbers: 5303313, 5644655, 6002807, and 6067374, and a publication to Estevez, et al. "A real-time histographic approach to road sign recognition"; and Escalera, et al. "Road traffic sign detection and classification".

Art Unit: 2621

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL G MARIAM whose telephone number is 703-305-4010. The examiner can normally be reached on M-F (7:00-4:30) FIRST FRIDAY OFF.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, LEO BOUDREAU can be reached on 703-305-4607. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
DANIEL MIRIAM  
PRIMARY EXAMINER

October 28, 2004